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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,641	02/04/2004	Richard E. Raby	59525US002	3710
32692 7590 11/05/2010 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER BALLINGER, MICHAEL ROBERT	
			ART UNIT	PAPER NUMBER
			3776	
			NOTIFICATION DATE	DELIVERY MODE
			11/05/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/771,641	Applicant(s) RABY ET AL.	
	Examiner Michael R. Ballinger	Art Unit 3776	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-86 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-86 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In acknowledgement of the amendments made 19 October 2010, claims 1-86 are currently pending.

Response to Arguments

2. Applicant's arguments, see the remarks, filed 19 October 2010, with respect to the rejection(s) of claim(s) 1-86 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S. 5,712,965).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-36 and 38-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S. 5,712,965).

5. Per claims 1-4, 39-43, 75-77, 80-84 Chapoulaud teaches a method, system, and non-transitory computer readable medium for displaying, via a user interface of a computing device, a three-dimensional (3D) digital representation of a tooth of a dental arch within a 3D environment and displaying a 3D representation of an orthodontic appliance in the 3D environment (see e.g., figures 5E and 5F). Additionally, Chapoulaud teaches allowing the practitioner to move the orthodontic appliance relative to the 3D representation of the tooth with

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in the 3D environment (paragraph 0091). The Examiner notes, Chapoulaud fails to explicitly teach displaying via the user interface a two-dimensional planar guide with the 3D environment as a visual aid to the practitioner in the placement of the appliance or as the user moves the orthodontic appliance rendering the planar guide at a location that is based on a position of the appliance. However, figures 16, 17A to 17C, and 18A to 18C of Fujita teach the use of planar guides (i.e., each face of the circumscribed rectangular parallelepiped) to aid in the positioning of solid 3D object within a 3D environment where the planar guides are rendered at a location that is based on a position of the 3D object within the 3D environment (see column 5, lines 63 to column 6, lines 59 and column 17, lines 3 to column 18, line 33). Additionally, Fujita teaches generating the planar guide within the 3D environment relative to a coordinate system associated with the orthodontic appliance (column 14, lines 53-57).

6. Therefore, it would have been obvious to one having ordinary skill in the art to modify the method, system, and medium of Chapoulaud use the method of manipulating 3D objects as taught by Fujita to manipulate the orthodontic appliance of Chapoulaud in order to improve operability as taught by Fujita (column 6, lines 27-36).

7. Per claims 5-6, 44-45, and 78 the Examiner notes, Chapoulaud fails to explicitly teach a mesial planar guide and a distal planar guide as claimed. However, the incorporation of the circumscribed parallelepiped of Fujita in to the environment of Chapoulaud would result in both mesial planar guides and distal planar guides. Specifically, it is clear from Fujita that the faces of the circumscribed parallelepiped represent the extents of the object in three orthogonal axis. As such, a parallelepiped circumscribed around a dental appliance would provide mesial and distal planar guides as claimed. Similarly with respect to claims 7-11, 46-50 and 85-86, the six

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faces of the parallelepiped of Fujita which circumscribe a dental appliance of Chapoulaud would include an occlusal planar guides or midlateral (i.e., the top face of the parallelepiped), a midfrontal plane (i.e., the front face of the parallelepiped), a midsagittal planar guide (i.e., the left or right face of the parallelepiped) and a gingival planar guide (i.e., the bottom face of the parallelepiped). With respect to claim 13 and 51, the planar guides of Fujita include at least two lines (see figure 17A to 17C and 18A to 18C).

8. With respect to claim 14 and 15, the Examiner notes, Chapoulaud teaches displaying teeth in different colors (paragraph 0084) but fails to teach displaying the planar guides as different colors. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Chapoulaud and Fujita to include displaying the planar guides as different colors based on input from a user, in order to more easily differentiate the different planar guides. Furthermore, with respect to claims 12, 15-16, and 51, it is noted neither Chapoulaud nor Fujita teach adjusting the transparency or opaqueness of the planar guides. However, the adjusting the level of transparency of 3D virtual objects is well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Chapoulaud and Fujita to include the step of adjusting the transparency or opaqueness in order to more easily discern underlying structures or objects.

9. With respect to claim 18 and 19, Chapoulaud teaches storing data describing attributes for the types of appliances that may be selected (i.e., bracket design data, paragraph 0062, 0094), but fails to explicitly teach that the planar guides are displayed based on the stored data.

However, the planar guides of Fujita are arranged so as to circumscribe the 3D object. As such,

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the displaying of the planar guides would be based off of at least the dimension of the orthodontic appliance and thus meets the limitations as claimed.

10. Per claims 21-24 and 53-60, the Examiner notes neither Chapoulaud nor Fujita explicitly teach storing in a database planar guide data within the computing device, storing different types of planar guides for different types of appliances or teeth. However, it is clear from the disclosure of Fujita information regarding the planar guides is readily accessible upon the selection of a specific 3D object within the environment (i.e., column 17, lines 12-22, teaches selectively displaying planar guides based upon which solid is select by the user). Additionally, the use of a database as a storage means and a network are well known in the art. As such, the Examiner submits storing information with respect to the planar guides would be an inherent step in the method of Fujita since the planar guides are displayed immediately upon the identification of the solid. Furthermore, one having ordinary skill in the art would recognize that each planar guides for each of the orthodontic appliances of Chapoulaud to be manipulated by the method of Fujita would have attributes stored relating to the planar guides for that particular appliance. Similarly, each planar guide for each appliance for each tooth would have different attributes (e.g., their positions in the global coordinate system). Also per claim 25-28 and 61-64, the planar guides of Fujita would have stored attributes specifying shear angle (i.e., angle of rotation, column 18, lines 12-14) and scales (i.e., magnifications, column 19, lines 12-16) and automatically scaling the planar guides (i.e., column 19, lines 26-31) and automatically shearing (i.e., rotating) the planar guides (column 18, lines 27-33). Per claims 31-32 and 67-68, the Examiner notes, Chapoulaud and Fujita fail to explicitly teach storing statistical normal distances for the dimensions of the teeth. However, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to store and utilize statically normal teeth sizes in order to allow the device to minimize the amount of information that must be manual entered into the system.

11. Per claims 33-36 and 69-43, the Examiner notes, Chapoulaud fails to teach displaying visual markers relative to the planar guides at discrete intervals. However, Fujita teaches displaying visual markers on a rectilinear grid of semi-transparent lines or tick marks (column 11, lines 23-32, and figures 6A to 6K). Per claim 38 and 74, Chapoulaud teaches the appliance is a bracket.

12. Claims 29-30, 65-66, and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S. 5,712,965) and further in view of Kopelman et al. (U.S. 2003/014509).

13. Per claims 29-30 and 65-67 and 79, Chapoulaud and Fujita disclose a method and system that shows the limitations as described above; but fails to teach data of rules for orthodontic appliance. Kopelman et al. teach a method and system comprising data 110 of rules for applying the orthodontic appliance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system to comprise data of rules in order to obtain a desired outcome of positioning and orientation in view of Kopelman et al.

Allowable Subject Matter

14. Claim 37 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael R. Ballinger whose telephone number is (571)270-5567.

The examiner can normally be reached on Monday thru Friday 8:00 AM to 5:00 PM.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris L. Rodriguez can be reached on (571)272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Ballinger/
Examiner, Art Unit 3776

/Cris L. Rodriguez/
Supervisory Patent Examiner, Art Unit 3732